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ABSTRACT

This paper explores the different patterns of cognitive behavior of children from varying linguistic, socio-economic, and cultural backgrounds. Several perspectives on cognitive consequences as related to language, class, and culture are presented. The sample consisted of grade one children, one hundred ten boys and one hundred girls between six and one half years and seven years of age, in various types of first and second language programs in Alberta and Hong Kong. Four tests of linguistic and cognitive ability were administered. The results indicated that differences in cognitive performance accrued from first and second language acquisition could be related to cognitive abilities. In second language or immigrant education, the interpretation of the minority experience becomes more meaningful when it is viewed with class experience. The hostile climate of the working class immigrant children robs them of the chance to develop mother tongue and cultural identity. The method of administering second language education aggravates the social situation by further segregating the child. (JK)

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# LANGUAGE, CLASS, AND CULTURAL IMPLICATIONS ON FIRST AND SECOND LANGUAGE ACQUISITION: A CROSS-CULTURAL STUDY OF COGNITIVE CONSEQUENCES.*

by Agnes Yu and Bruce Bain

## Introduction

Research in the area of first and second languages, how they are acquired, and what roles they play in human cognition, has become a relevant topic in education in the Western industrialized nations. As these nations are experiencing an increase of im/migrant workers from foreign lands, the question of whether educational systems are serving adequately the needs of the children of immigrants is raised. The social and political implications of such a question calls for a broad-based study into this area.

The purpose of this paper is to explore the different patterns of cognitive behaviors of children from varying linguistic, socio-economic, and cultural backgrounds. The main thrust of this study is based on the works of Vygotsky, particularly his conceptualizations on the role of language in human cognitive development. A secondary thrust is the works of Bernstein on class-related issues in language and educability. These two approaches blend well into a theoretical position which could offer a broader interpretation of the various influences on cognitive behaviors. In addition, the issue of second language acquisition within a social framework will also be presented. Such an addition could shed more light into the whole intricate area of human cognition.

## Vygotsky's Theory of Language and Cognition

Vygotsky (1939, 1962) offers a thesis of the "sociogenesis of cognitive development," that is, all higher cognitive functions such as logical memory, voluntary attention, verbal thinking, concept formation, and speech originate on the social plane, and only through progressive internalization, become psychological phenomena. This thesis postulates a two-plane model of cognitive

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development. On the first plane, the social, between people, elementary cognitions are derived from social dialogues and interactions between the parent and child. Since cognitions can only occur within a *two-person* dynamic, it is called an inter-mental category of cognition. The child must first learn to use *signs* through an external or physical system, that is, by pointing gestures or voiced speech, in a social context. Gradually the infant learns to use signs not only to direct others but also his/her own cognitive activities in his/her own mind. This process of progressing from the two-person social plane to the one-person psychological plane is called *internalization*. This initial social means of cognition, according to Vygotsky, is contingent upon the acquisition of language.

Language is not merely speech sounds or rules of grammar. It is a tool for communication. It also provides the foundation for all activities characteristic of the human mind, for example, in perception, in organization of experience, in formulation of ideas and concepts, and in expression of emotions. Essentially language constitutes a structural scheme by which the world can be named, classified, ordered, and organized. To Vygotsky, all these activities originate in a social context.

Thus, as an infant begins to internalize the social means of language, and makes this his/her own, s/he begins to include self-dialogues as part of his/her developing repertoire of higher cognitive activities. These activities propel the child to a second plane, a higher psychological plane, in which cognitive activities become more complex and are one-person sign operations. This is called the intra-mental category of cognition. At this higher level of cognition, dialogues can now occur within the child rather than only with an adult. To Vygotsky, the mastery of the sign system, in which language is the sign *par excellence*, is essentially social oriented and then gradually becomes individual and psychological oriented, for the

purpose of internally directing one's own cognitive activities. Thus, the mastery of language is a pre-requisite for cognitive development. In this thesis, is is never language in isolation, but language as it mediates the dynamics of social and psychological discourse, which plays a significant role in the formation of all higher cognitive functions.

Vygotsky's thesis is a theory of general human development. It highlights the integral role of language in the process of cognition, as well as the intimate role language plays in a child's self creation. It also emphasizes the role of the adult in the primordial relationship with the infant. All these are necessary steps which lead an infant to full cognitive functions. This general theory of cognitive development pertains to first language acquisition. The implications of this theory are that an individual's ability in thought and speech is derived from the joint labor of the initial social relationship, and in particular the quality of this relationship. If such a relationship is enriching, then the child's language and cognitive abilities may be enhanced. However, when such a relationship is impoverished, these abilities could be affected.

The cases of feral and socially deprived children illustrate the importance of the initial social relationship. In the case of feral children, raised in isolation and in association with animals, they could never acquire *full* human capacities (i.e., particularly in the capacities for symbolization and social interaction), even when they come under human care. In the case of socially deprived children, their capacity for language and cognition is closely related to their specific initial social experience (see Schmidt, 1973).

Vygotsky extends the concept of language and cognition to include a *cultural* dimension. He states that the sign-mediated cognitive processes of humans are historically formed, socially and culturally transmitted from

one person to another, from one generation to the next. Different cultures, then, will acquire different social practices of sign usage. Individuals from different cultures would develop specially tailored cognitive functions relevant to their particular needs. Vygotsky further illustrates these cultural differences in cognition. For example, cultures which have no written language would usually develop better visual memory than logical memory. In writing cultures, logics dominate visuals. Thus, each culture would have its own particular practice and specific world-view.

The above examples illustrate the importance of the quality of social and cultural interaction in the development of language and cognition. Bernstein's work on class-related issues of language acquisition and educational experience could further enhance understanding in this general area.

Bernstein's Theory of Speech Codes

Bernstein advances a theory which attempts to explicate the critical relationships between class, language and educability. His conceptualizations on the "restricted" and "elaborated" speech codes have permeated the classrooms of England, and have raised questions on educational practice.

Bernstein (1971) offers a thesis of "fundamental qualitative differences in speech" between the working class and the middle class. He postulates that the differences lie in their use of the grammatical system and vocabulary. Essentially, these differences arise from the different relationships to the class structure in a society, particularly in the relationships to the family, peer group, school, and community. They are the products of different socialization patterns which pre-dispose the way language is acquired, and consequently expressed. Accordingly, children from different social classes would acquire their respective kinds of socio-cultural identity and their respective ways in which they express this identity. They also perceive different orders of relevance and relations, of understanding

of themselves, others, and the world (Rosen, 1972).

Basically, the elaborated code of speech is associated with middle class socialization practices in a person-oriented type of family experience. It is characterized as flexible, universalistic, and context-free. The restricted code, on the other hand, is associated with working class socialization practices, in a position-oriented type of family experience. It is characterized as rigid, particularistic, and context-bound. Each of these speech codes, according to Bernstein, has ramifications in educability.

Critics of Bernstein's theory (Rosen, 1972) have found it to be too definitive, lacking in scientific rigor, and doubtful in its generalization. In particular, in countries which aspire to a democratic tradition, the ideas of a class-delineated behavior or speech system are not readily acceptable. Nevertheless, Bernstein's ideas emphasize a fundamental relationship between language and class structure. These ideas have promoted heuristic studies on education concerning the working class child, his/her values, and his/her culture. When these basic ideas are juxtaposed with those in the area of im/migrant or second language education, it opens a potent area of inquiry.

Second Language Acquisition

Bain (1977) has proposed a speech typology of restricted unilingual, disruptive bilingual, elaborated unilingual, and creative bilingual, based on the quality of first and second language acquisition. He suggests that these four speech types constitute a continuum of linguality, representing increasing flexibility in the means of cognition. He further suggests that various patterns of cognitive behavior are a consequence of the social conditions under which the languages are learned, conditions particularly pertaining to the home and school environments.

Skutnabb-Kangas (1976) has done extensive work on the phenomenon of "semilingualism," related to im/migrant and second language education. This semilingual phenomenon refers to the inability to speak proficiently any language, whether is is the mother tongue or the second language. This occurs only within a bilingual, usually a diglossic context, never within a unilingual context. Socially defined, it refers to a diglossic setting where there is no accessibility to the development of the reading and writing skills in the mother tongue. In this same setting, all inter-cultural affairs with the host society, an important one of which is schooling, is conducted in the official, second language.

The above work analyzed the *quantitative* and *qualitative* aspects of language acquisition in semilingualism. It was found that in the quantitative measure, where a semilingual child is pitted against unilingual norms, such measures did not do justice to the communicative competence, rather, it showed the linguistic incompetence (i.e., with respect to vocabulary) of this child. In the qualitative measure, where the more universal aspects of language (i.e., as a means of thought, volition, and emotion), the results revealed that semilinguals are not as efficient in these communicative aspects. These studies call attention to the kinds of social and cultural circumstances which produce semilingualism. They caution researchers and educators to consider social structure as the cause, and not semilingualism as the cause of poor school performance, in the analysis of differential cognitive behaviors.

In sum, several perspectives on cognitive consequences as related to language, class, and culture have been presented. Although the variable of culture has not been distinctly identified by each perspective, in the main, culture is inextricably implied in the various processes (language, class) leading to cognition. In this paper, there are three main focus of ideas.

First, Vygotsky's thesis on general cognitive development which is contingent upon the acquisition of language. Second, Bernstein's thesis on the qualitative differences of speech and socialization. And third, the concept of semilingualism and disruptive bilingualism in im/migrant and second language education and the social ramifications. The experimental portion of this study is based on the above frameworks.

## METHODOLOGY

### Subjects

The subject sample consisted of Grade 1/Primary 1 children, 110 boys and 100 girls. They were in their eighth month of schooling, towards the end of their first year of formal schooling. The children's ages were between 6y6mos to 7y0mos. They were in various types of first and second language programs in Alberta and Hong Kong. The children were classified into 7 groups, of 30 in each group.

Group classifications were based on several variables: 1) place of birth; 2) nationality; 3) birth place of parents; 4) educational backgrounds of parents; 5) occupational class of parents (Blishen's socio-economic scale); 6) type of education received by the children; and 7) linguality (based on a linguistic competence scale devised by Yu, 1981).

1) Place of birth ranges from Canada, China, and Hong Kong.
2) Nationality ranges from Canadian citizens, Chinese citizens, and Hong Kong British Subjects.
3) Birth place of parents ranges from Canada, Britain, China, and Hong Kong.
4) Educational backgrounds of parents range from primary, junior high, high school graduate, technical school and college, and university graduates.
5) Occupational class of parents range from non-skilled laborers, semi-

skilled laborers, skilled laborers, technicians, clerks, salespersons, teachers, nurses, engineers, electricians, accountants, senior government officials, and doctors.

6) Type of education received by the children ranges from private to public schools, from traditionally oriented to progressively oriented, from unilingual to bilingual programs, immersion, and reception/transition ESL programs.

7) Linguality ranges from semilingual, unilingual, compound bilingual, and fluent bilingual.

The following groups were identified: *Group A*, working class, Hong Kong Chinese unilinguals; *Group B*, working class, Anglo-Canadian unilinguals; *Group C*, working class, Chinese-Canadian bilinguals; *Group D*, middle class, Anglo-Canadian unilinguals; *Group E*, middle class, Chinese-Canadian bilinguals; *Group F*, middle class, Hong Kong Chinese bilinguals; and *Group G*, middle class, Canadian (English/French) bilinguals.

Test Instruments

Four tests were administered. These tests belonged to two types, one one linguistic ability, the other on cognitive ability.

Test of linguistic ability: Peabody Picture Vocabulary Test (PPVT). Tests of cognitive ability: Piagetian Conservation Test (PCT), Coloured Ravens Progressive Matrices (CRPM), and Vygotskian Word Substitution Test (VWST).

Testing Procedure

An informal interview was conducted with each child before the testing session. This served as a means to establish rapport with the child, and to gather biographical data. Whenever appropriate, additional information was also requested from the teachers.

The four tests were given in a random order, at two sessions. This was done in order to minimize the problems of fatigue and attention span. The Peabody Picture Vocabulary Test and the Vygotskian Word Substitution Test were given in parallel forms in the second language to all the bilingual children only.

The PPVT was given in the mother tongue to all children. This test assesses linguistic ability, more accurately associated with vocabulary.

For the Piagetian Conservation Test, the demands of this particular test were such--involving perceptual and cognitive abilities--that we felt a parallel form of the test, to be administered in a second language to the bilingual children, would be unnecessary. Thus, this test was given in the mother tongue to all the children.

For the Coloured Ravens Progressive Matrices, it was administered in the mother tongue. A parallel version in a second language was not necessary, since this test does not require any overt verbal response. When this test is given in conjunction with a vocabulary test, such as the PPVT, it could give an indication of an individual's "present capacity for intellectual activity, irrespective of his acquired knowledge, or vice versa."

The Vygotskian Word Substitution Test was given to all children in their mother tongue. Subsequently all the bilingual children were given a parallel version in their second language. This was felt to be necessary since the theoretical assumptions of this test presuppose a relationship between language and cognition.

## RESULTS AND DISCUSSION

The results of this study reveal interesting findings. They indicate that differences in cognitive performance accrued from first and second language acquisition could be related to such variables as social class, culture, and the quality of social relationships. See Table 1.

At the linguistic level, as indicated by the PPVT (see Table 2), in which children from all groups were tested in their first languages, the result is significant between the middle and working classes. There is no difference within the various working class groups (*Groups A, B & C*). However, a significant difference within the middle class groups is noted. This difference is found between the Anglo-Canadians (*Group D*) and the Chinese-Canadian (*Group E*) children. This could perhaps be attributed to the fact that the Chinese-Canadian children received lesser exposure to their mother tongue than their Amglo-Canadian counterparts, outside of the immediate home environment. It also suggests that there could be a possible language dominance, a dominance of English over Chinese, among the Chinese-Canadian children of the middle class. Even with this consideration, the Chinese-Canadian children's scores are still higher than the Hong Kong Chinese children of the working class. This latter finding suggests that there could be a *qualitative* difference in the acquisition of the first language between individuals of different social classes, vis a vis Bernstein's theory. Another explanation of this difference may lie in the difference in the quality of education each of these groups receive. The quality of environments of the home and school have induced differential cognitive outcomes in these children.

The acquisition of the second language by the "bilingual" children have provided interesting results; results which further substantiate our findings in the acquisition of the first language (see Table 3). All bilingual children were given an alternate form of the PPVT, tested in their second languages. The significant difference lies between the middle class (*Groups E, F & G*) and the working class (*Group C*). These patterns of performance further support our claim of social class differences and the qualitative differences in the process of language acquisition, whether this process occurs in the mother tongue or the second language.

At the cognitive level, three tests were given to all the children. The pattern of results replicate the findings of the linguistic test (see Table 1).

The PCT results replicate those of the PPVT, in terms of class differences (see Table 4). One important phenomenon which was apparent during the testing session was that in general, the working class children performed comparably to the middle class children on the behavioral section of this test. However, on the explanatory section, the difference in performance was noted. The working class children, although were capable of performing on the behavioral domain, were weak on the explanatory domain--a domain which required verbal explanation of the logic of conservation. These latter groups' level of verbal ability was reflected in their deflated total scores on this test. No cultural difference was found cross-culturally.

In the CRPM, the pattern of results is similar to that of the PCT and CRPM, in terms of class differences (see Table 5). In the descending order of test performance, the pattern reads: *Group C*, *Group B*, *Group A*, *Group D*, *Group E*, *Group G*, and *Group F*.

There were dramatic significant differences between the bilingual groups of different social classes (between *Group C* and *Groups E, F, G*); and between all working class (*Groups A,B,C*) and middle class (*Groups D,E,F,G*), regardless of linguality. These findings present the following picture, that there is a definite social class difference in terms of cognitive ability. As the CRPM is considered as one of the best of the "non-biased" cross-cultural test of intellectual and cognitive ability, the findings point towards a class-based cognitive outcome, regardless of culture. When the CRPM findings are coupled with the PPVT, the relationship between cognitive ability and language ability is further affirmed. The results also further support our claim that qualitative differences in language and social experiences are closely related to cognitive abilities.

The VWST is a replication of the Ianco-Worall's (1972) study. It originates from the Vygotskian ideas on the names of things, and the interchangeability of these names. This test explores the cognitive flexibility aspect of cognition. When tested in the first language, the results display in an ascending order of test performance: *Group C*, *Group A*, *Group B*, *Group D*, *Group E*, *Group G*, and *Group F* (see Table 6). The pattern closely replicates that of the CRPM, except for *Groups A* and *B*, in which their order was interchanged.

The results on the second language version of the VWST reveal an interesting finding (see Table 7). There are significant differences between the bilingual groups of different social classes, between *Group C* and *Groups E, F, G*. Significant differences also exist between groups from the same geographical and cultural backgrounds: the Chinese-Canadian bilinguals of the middle class (*Group F*) and the working class (*Group C*). This suggests that the quality of language acquisition is an important factor in the development of cognitive flexibility. As to cross-cultural differences, they were non-significant.

## CONCLUSION

This study has given rise to several contentious issues. They are: 1) class-related experience and cognitive development; 2) language-related experience and cognitive development; 3) cultural experience and cognitive development; 4) the importance of the quality of the initial social relationship; and 5) the relative equitability in the distribution of educational resources in society, particularly pertaining to im/migrant children.

On the first issue, there is strong evidence to support a class-based claim in cognitive development. These class-related differences are found in the basis of the initial social means of cognition--language, and the ensuing social experience within a family and a particular community. For

the middle class child, an enriching home environment and a continuity of home-school values have acted as support systems for this child. Conversely, for the working class child, an impoverished home environment and a discontinuity of the home-school values could act as deterrents to the child's cognitive development.

On the second issue, again, there is strong evidence to support the claim of a qualitative language experience and cognitive development. The more capable a child is in his/her language ability, the better his/her cognitive ability, as language is inextricably interwoven with cognition. The quality of this language experience also implicates into the domain of second language acquisition. When social circumstances provide a positive identity for the mother tongue and support for the second language, as in French in Canada, and English in Hong Kong, the acquisition of a second language becomes cognitively additive. At this point, a qualitative must be made regarding the situation in Hong Kong. It should be noted that the English language is supported mainly by the upwardly mobile class; for the working class, their life situations are far removed from circumstances which might require skills in the English language. For the im/migrant child, when social circumstances are opposing the maintenance of the mother tongue and not conducive to the acquisition of the second language, the child suffers, educationally and psychologically. The lack of social support and cultural identity may have far-reaching consequences.

On the third issue, the cross-cultural findings of this study did not reveal any significant contrastive differences in terms of cognitive outcomes. Some differences, although relatively small, can be discerned between the two diverse cultures. Social class and linguality aside, a stronger emphasis on scholastic achievement is noted among the Hong Kong groups. This emphasis seems to pervade all levels of living in the Hong Kong residents. Achievement

is highly regarded, particularly by the middle class.

On the fourth issue, the importance of the quality of the initial social relationship, cannot be emphasized often enough. The capacity of a child's cognitive abilities often develops according to the quality of this social means. For children who come from a less desirable social circumstance, it would seem that supportive actions are required to remedy the early condition. As these would not be forthcoming from the family, the responsibility for the provision of support would fall on the school.

On the last issue, the equitable distribution of educational resources in society is seriously questioned. It is common knowledge that the influential power exerted by the more vocal and "concerned" parents of the affluent class has resulted in unequal distribution of educational resources and opportunities. A case in point in Canada is the administration of the French immersion or bilingual programmes. These are often granted on demand by parents. Similarly, in Hong Kong, parental financial circumstances often will dictate the type of educational resources or opportunities a child will have access to. The children of the working class, as our results demonstrate, are obvious victims of this inequitability. This inequitability is even more drastic when the issue of second language education is concerned.

In second language or im/migrant education, the interpretation of the minority experience becomes more meaningful and apparent when it is viewed together with class experience. For the working class immigrant child, the hostile climate of the community is robbing him/her the chance to develop the mother tongue and the cultural identity. At the same time, the way second language education is administered, it further aggravates the social situation. This child is being segregated into his/her own little ghetto. S/he unwittingly would become the "semilingual" of the society. It seems apparent that the home and school gap is so wide in such cases that nothing

short of radical social and educational actions are required.

In conclusion, we have attempted to demonstrate the various influences in cognitive development, and how these influences implicate in the process of first and second language acquisition. The most important factor, that of *class-related* experiences in the linguistic and social domains of cognitive behavior, is especially emphasized. For more enlightened ideas on second language education for im/migrant children, we might well consider the research implications of the works of Joshua Fishman, Vandra Masemann, Tove Skutnabb-Kangas, and Bernard Spolsky.

*An earlier version of this paper was presented at the Third Los Angeles Second Language Research Forum, Los Angeles, February 29, 1980.

REFERENCES

Bain, B. The consequences of unilingualism, disruptive bilingualism, and creative bilingualism for the development of the body schema: A cross-cultural study in Canada, Italy and West Germany. Presented at The First International Symposium on Pedolinguistics, Tokyo, Japan, 1977.

Bernstein, B. Social class, language and socialization. In P.O. Giglioli (Ed.), *Language and social context*. London: Penguin, 1972.

Fishman, J. and Cooper, R.L. Alternative measures of bilingualism. *Journal of Verbal Learning and Verbal Behavior*, 1969, 8, 276-282.

Ianco-Worall, A. Bilingualism and cognitive development. *Child Development*, 1972, 43, 1390-1400.

Lawton, D. *Social class, language and education*. London: Routledge & Kegan Paul, 1968.

Masemann, V. Ethnography of the bilingual classroom. *International Review of Education*, 1978, 24, 295-307.

Rosen, H. *Language and class. A critical look at the theories of Basil Bernstein*. Bristol: Falling Wall Press, 1972.

Schmidt, W.H.O. *Child development: The human, cultural and educational context*. New York: Harper & Row, 1973.

Skutnabb-Kangas, T. and Toukomaa, P. *Teaching migrant children's mother tongue and learning the language of the host country in the context of the socio-cultural situation of the migrant family*. Tutkimuksia Research Reports. Finland: The University of Tampere, 1972.

Spolsky, B. *The language education of minority children*. Rowley, Mass.: Newbury House, 1972.

Spolsky, B. and Cooper, R.L. (Eds.) *Case studies in bilingual education*. Rowley, Mass.: Newbury House, 1978.

Vygotsky, L.S. *Thought and language*. Cambridge: M.I.T. Press, 1962.

Vygotsky, L.S. Thought and speech. *Psychiatry*, 1939, 2, 29-54.

Yu, A.Y. *The implications of language, culture, social class, and cognitive style in higher cognitive processes: A cross-cultural, developmental study*. Ph.D. Dissertation. Edmonton: The University of Alberta, 1981.

Table 1

MEANS AND STANDARD DEVIATIONS ON PEABODY PICTURE VOCABULARY TEST, PIAGETIAN CONSERVATION TEST, COLOURED RAVENS PROGRESSIVE MATRICES, AND VYGOTSKIAN WORD SUBSTITUTION TEST ON ALL UNILINGUAL AND BILINGUAL GROUPS

| Groups | Ss | PPVT | | PCT | | CRPM | | VWST | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| A | 30 | 60.43 | 5.04 | 7.60 | 1.65 | 18.03 | 2.09 | 8.93 | 1.17 |
| B | 30 | 59.30 | 5.21 | 7.53 | 1.65 | 17.87 | 2.13 | 9.00 | 1.36 |
| C | 30 | 56.77 | 5.74 | 7.13 | 1.61 | 16.63 | 2.09 | 8.33 | 1.18 |
| D | 30 | 70.33 | 3.26 | 9.63 | 1.43 | 19.80 | 2.22 | 9.57 | 0.63 |
| E | 30 | 65.43 | 3.84 | 9.37 | 1.30 | 20.07 | 1.98 | 9.87 | 0.43 |
| F | 30 | 69.17 | 3.09 | 9.83 | 1.23 | 20.77 | 1.85 | 9.93 | 0.25 |
| G | 30 | 69.10 | 3.47 | 9.70 | 1.32 | 20.50 | 2.05 | 9.90 | 0.31 |

TABLE 2

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS ON PPVT

ON ALL UNILINGUAL AND BILINGUAL GROUPS

| | | D | F | G | E | A | B | C |
|---|---|---|---|---|---|---|---|---|
| | | 70.33 | 69.17 | 69.10 | 65.43 | 60.43 | 59.30 | 56.77 |
| C | 56.77 | 13.57* | 12.40* | 12.33* | 8.67* | 3.67 | 2.53 | 0.00 |
| B | 59.30 | 11.03* | 9.87* | 9.80* | 6.13* | 1.13 | 0.00 | |
| A | 60.43 | 9.90* | 8.73* | 8.67* | 5.00* | 0.00 | | |
| E | 65.43 | 4.90* | 3.73 | 3.67 | 0.00 | | | |
| G | 69.10 | 1.23 | 0.07 | 0.00 | | | | |
| F | 69.17 | 1.17 | 0.00 | | | | | |
| D | 70.33 | 0.00 | | | | | | |

*P < .001

TABLE 3

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS ON PPVT

ON ALL BILINGUAL GROUPS

| | | E | F | G | C |
|---|---|---|---|---|---|
| | | 68.87 | 68.80 | 66.60 | 52.53 |
| C | 52.53 | 16.33* | 16.27* | 14.07* | 0.00 |
| G | 66.60 | 2.27 | 2.20 | 0.00 | |
| F | 68.80 | 0.07 | 0.00 | | |
| E | 68.87 | 0.00 | | | |

*P< .001

TABLE 4

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS ON PCT

ON ALL UNILINGUAL AND BILINGUAL GROUPS

| | | F | G | D | E | A | B | C |
|---|---|---|---|---|---|---|---|---|
| | | 9.83 | 9.70 | 9.63 | 9.37 | 7.60 | 7.53 | 7.13 |
| C | 7.13 | 2.70* | 2.57* | 2.50* | 2.23* | 0.47 | 0.40 | 0.00 |
| B | 7.53 | 2.30* | 2.17* | 2.10* | 1.83* | 0.07 | 0.00 | |
| A | 7.60 | 2.23* | 2.10* | 2.03* | 1.77* | 0.00 | | |
| E | 9.37 | 0.47 | 0.33 | 0.27 | 0.00 | | | |
| D | 9.63 | 0.20 | 0.07 | 0.00 | | | | |
| G | 9.70 | 0.13 | 0.00 | | | | | |
| F | 9.83 | 0.00 | | | | | | |

*P < .001

TABLE 5

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS ON CRPM

ON ALL UNILINGUAL AND BILINGUAL GROUPS

| | | F | G | E | D | A | B | C |
|---|---|---|---|---|---|---|---|---|
| | | 20.77 | 20.50 | 20.07 | 19.80 | 18.03 | 17.87 | 16.63 |
| C | 16.63 | 4.13** | 3.87** | 3.43** | 3.17** | 1.40 | 1.23 | 0.00 |
| B | 17.87 | 2.90** | 2.63** | 2.20* | 1.93 | 0.17 | 0.00 | |
| A | 18.03 | 2.73** | 2.47** | 2.03* | 1.77 | 0.00 | | |
| D | 19.80 | 0.97 | 0.70 | 0.27 | 0.00 | | | |
| E | 20.07 | 0.70 | 0.43 | 0.00 | | | | |
| G | 20.50 | 0.27 | 0.00 | | | | | |
| F | 20.77 | 0.00 | | | | | | |

**P < .001

*P < .01

TABLE 6

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS ON VWST

ON ALL UNILINGUAL AND BILINGUAL GROUPS

| | | F | G | E | D | B | A | C |
|---|---|---|---|---|---|---|---|---|
| | | 9.93 | 9.90 | 9.87 | 9.57 | 9.00 | 8.93 | 8.33 |
| C | 8.33 | 1.60* | 1.57* | 1.53* | 1.23* | 0.67 | 0.60 | 0.00 |
| A | 8.93 | 1.00* | 0.97 | 0.93 | 0.63 | 0.07 | 0.00 | |
| B | 9.00 | 0.93 | 0.90 | 0.87 | 0.57 | 0.00 | | |
| D | 9.57 | 0.37 | 0.33 | 0.30 | 0.00 | | | |
| E | 9.87 | 0.07 | 0.03 | 0.00 | | | | |
| G | 9.90 | 0.03 | 0.00 | | | | | |
| F | 9.93 | 0.00 | | | | | | |

*P < .001

TABLE 7

NEWMAN-KEULS COMPARISON BETWEEN ORDERED MEANS ON VWST

ON ALL BILINGUAL GROUPS

| | | F | G | E | C |
|---|---|---|---|---|---|
| | | 9.90 | 9.87 | 9.83 | 7.50 |
| C | 7.50 | 2.40* | 2.37* | 2.33* | 0.00 |
| E | 9.83 | 0.07 | 0.03 | 0.00 | |
| G | 9.87 | 0.03 | 0.00 | | |
| F | 9.90 | 0.00 | | | |

*P < .001